

IN THE CLAIMS:

Please amend the claims as follows:

Cancel claims 1-44.

45. (New) A captured image data processing method characterized by:

a step of subtracting, from a pixel value of each pixel which constitutes second image data acquired by way of an imaging process causing a first light source to emit light, a pixel value of a corresponding pixel of first image data acquired by way of an imaging process causing the first light source not to emit light, and obtaining difference image data corresponding to an image captured in an irradiation environment of only the first light source;

a difference image data pixel value adjustment processing step of performing white balance adjustment process as a pixel value adjustment process with respect to the difference image data; and

a final pixel value adjustment image generation step of applying image data of adjusted pixel values generated in the difference image data pixel value adjustment processing step, and generating a final pixel value adjustment image.

46. (New) The captured image data processing method according to claim 45, characterized by further including :

a first image data pixel value adjustment processing step of performing pixel value adjustment process with respect to the first image data; wherein

the final pixel value adjustment image generation step is a step of performing a pixel value addition process for the corresponding pixels of two image data of adjusted pixel values acquired by the difference image data pixel value adjustment processing step and the first image

data pixel value adjustment processing step, and generating final pixel value adjustment image data.

47. (New) The captured image data processing method according to claim 46, characterized in that the difference image data pixel value adjustment processing step is a white balance adjustment process according to a parameter set based on an light component of the first light source, and the first image data pixel value adjustment processing step is a white balance adjustment process according to a parameter set based on an ambient light component which does not contain the first light source.

48. (New) The captured image data processing method according to claim 47, characterized in that the parameter is a parameter represented by a 3×3 matrix, the matrix applied for conversion of color components which constitute a color of each pixel.

49. (New) The captured image data processing method according to claim 48, characterized in that the 3×3 matrix is a matrix set as 0 with exception to diagonal components.

50. (New) The captured image data processing method according to claim 45, characterized by further including a pixel value addition step of adding a pixel value of each pixel of the image data of adjusted pixel values generated in the difference image data pixel value adjustment processing step to a pixel value of a corresponding pixel of the first image data; wherein

the final pixel value adjustment image generation step is a step of performing the pixel value adjustment with respect to the image data generated in the pixel value addition step, and generating the final pixel value adjustment image data.

51. (New) The captured image data processing method according to claim 50, characterized in that the difference image data pixel value adjustment processing step is a white balance

adjustment process according to a parameter set based on ambient light component which does not contain the first light source.

52. (New) The captured image data processing method according to claim 45, characterized by further including:

a motion detecting step of detecting a moving portion where a subject moves according to the difference data of a plurality of image data; and

a moving portion pixel value adjustment step of performing pixel value adjustment process with respect to the moving portion.

53. (New) The captured image data processing method according to claim 52, characterized in that the moving portion pixel value adjustment step has:

a step of calculating a light intensity scalar ratio of two light sources when the first light source is caused or not caused to emit light, as data corresponding to a pixel of a motionless portion adjacent to a moving portion;

a step of using a radial basis function (RBF) so as to calculate the light intensity scalar ratio corresponding to each pixel of the moving portion;

a first pixel value calculation step of calculating the pixel value, as the first pixel value, of each pixel of the moving portion in an image which is equivalent to the image captured in an irradiation environment of the first light source only, based on the light intensity scalar ratio corresponding to each pixel of the moving portion;

a second pixel value calculation step of calculating the pixel value, as the second pixel value, of each pixel of the moving portion in an image which is equivalent to the image captured in an ambient light irradiation environment where the first light source is not included, based on the light intensity scalar ratio corresponding to each pixel of the moving portion;

a first pixel value adjustment processing step of performing the pixel value adjustment process, based on the first pixel value calculated in the first pixel value calculation step;

a second pixel value adjustment processing step of performing the pixel value adjustment process, based on the second pixel value calculated in the second pixel value calculation step;
and

a pixel value addition step of adding two adjustment pixel values generated in the first pixel value adjustment processing step and the second pixel value adjustment processing step.

54. (New) The captured image data processing method according to claim 53, characterized in that the first pixel value adjustment processing step is a white balance adjustment process according to a parameter set based on light component of the first light source; and

the second pixel value adjustment processing step is a white balance adjustment process according to a parameter set based on an ambient light component which does not contain the first light source.

55. (New) The captured image data processing method according to claim 52, characterized in that the moving portion pixel value adjustment step further has:

a step of calculating a color component ratio (α_r , α_g , α_b) of a pixel value of an inner peripheral pixel of the moving portion to an average pixel value of outer peripheral pixels of the moving portion adjacent to the inner peripheral pixel of the moving portion;

a step of constructing the radial basis function (RBF) based on the color component ratio corresponding to each pixel by considering all the inner peripheral pixels in the moving portion as sample points; and

a step of calculating the color component ratio corresponding to each pixel of the moving portion, based on the radial basis function (RBF), and multiplying the color component ratio with an image to be compensated and obtaining a compensation pixel value.

56. (New) The captured image data processing method according to claim 45, characterized by further including:

a motion detecting step of detecting a moving portion where a subject moves according to the difference data of a plurality of image data;

and a step of performing the pixel value adjustment process based on the second image data acquired by way of an imaging process causing the first light source to emit light when a proportion of the whole image of the moving portion is higher than a predetermined threshold value; wherein

the pixel value adjustment data based on the second image data is set as a final pixel value adjustment data.

57. (New) The captured image data processing method according to claim 56, characterized in that the pixel value adjustment process based on the second image data is either a white balance adjustment process according to a parameter set based on a light component of the first light source, the white balance adjustment process according to a parameter set based on ambient light component not containing the first light source, or a white balance adjustment process according to a parameter set based on an intermediate light component between the first light source and ambient light component not containing the light component of the first light source.

58. (New) A captured image data processing apparatus characterized by:

a memory for storing first image data acquired by way of an imaging process causing the first light source not to emit light, and a second image data acquired by way of an imaging process causing the first light source to emit light; and

a data processing unit for performing a pixel value adjustment process based on the image data stored in the memory;

the data processing unit including:

a difference image data acquisition unit for subtracting, from a pixel value of each pixel which constitutes the second image data, a pixel value of a corresponding pixel of the first image data, so as to acquire difference image data corresponding to image captured in an irradiation environment of only the first light source;

a difference image data pixel value adjustment unit for performing a white balance adjustment process as the pixel value adjustment process with respect to the difference image data; and

a final pixel value adjustment unit for performing a final pixel value adjustment by using a image data of adjusted pixel values generated in the difference image data pixel value adjustment unit.

59. (New) The captured image data processing apparatus according to claim 58, characterized in that the data processing unit further includes first image data pixel value adjustment unit for performing pixel value adjustment process with respect to the first image data; wherein

the final pixel value adjustment unit is arranged to perform pixel value addition process for corresponding pixels of two image data of adjusted pixel values generated in the difference

image data pixel value adjustment unit and the first image data pixel value adjustment unit, and generate the final pixel value adjustment image data.

60. (New) The captured image data processing apparatus according to claim 59, characterized in that the difference image data pixel value adjustment unit is arranged to perform the white balance adjustment process according to a parameter set based on a light component of the first light source; and

the first image data pixel value adjustment unit is arranged to perform the white balance adjustment process according to a parameter set based on ambient light component not including the first light source.

61. (New) The captured image data processing apparatus according to claim 58, characterized in that the data processing unit further includes a pixel value adding unit for adding a pixel value of each pixel of the image data of adjusted pixel values generated in the difference image data pixel value adjustment unit to a pixel value of a corresponding pixel of the first image data, and the final pixel value adjustment image generating unit performs pixel value adjustment with respect to image data generated in the pixel value adding unit, and generate the final pixel value adjustment image data.

62. (New) The captured image data processing apparatus according to claim 61, characterized in that the difference image data pixel value adjustment unit performs the white balance adjustment process according to a parameter set based on ambient light component not including the first light source.

63. (New) The captured image data processing apparatus according to claim 58, characterized in that the data processing unit includes :

a motion detection unit for detecting a moving portion of a subject based on difference data between a plurality of image data; and

a moving portion pixel value adjustment unit for performing pixel value adjustment process with respect to the moving portion.

64. (New) The captured image data processing apparatus according to claim 63, wherein the moving portion pixel value adjustment unit is characterized by:

calculating a light intensity scalar ratio of two light sources when the first light source is caused or not caused to emit light, as data corresponding to a pixel of a motionless portion adjacent to a moving portion;

calculating light intensity scalar ratio corresponding to each pixel of the moving portion by applying a radial basis function (RBF);

calculating pixel value as first pixel value of each pixel of the moving portion in an image which is equivalent to the captured image in an irradiation environment of only the first light source, based on light intensity scalar ratio corresponding to each pixel of the moving portion;

calculating pixel value as second pixel value of each pixel of the moving portion in an image which is equivalent to the captured image in an ambient light irradiation environment where the first light source is not included, based on light intensity scalar ratio corresponding to each pixel of the moving portion;

performing pixel value adjustment process, based on the first pixel value;

performing pixel value adjustment process based on the second pixel value; and

adding the generated two adjustment pixel values to perform a moving portion pixel value adjustment process.

65. (New) The captured image data processing apparatus according to claim 64, characterized in that the first pixel value adjustment process is performed as the white balance adjustment process according to a parameter set based on a light component of the first light source; and

the second pixel value adjustment process is performed as a white balance adjustment process according to a parameter set based on ambient light component not including the first light source.

66. (New) The captured image data processing apparatus according to claim 63, wherein the moving portion pixel value adjustment unit is characterized by:

calculating a color component ratio (α_r , α_g , α_b) of the pixel value of an inner peripheral pixel of the moving portion to an average value of the pixel value of an outer peripheral pixel of the moving portion adjacent to the inner peripheral pixel of the moving portion;

constructing a radial basis function (RBF) based on the color component ratio corresponding to each pixel by considering all the inner peripheral pixels in the moving portion as sample points;

calculating the color component ratio corresponding to each pixel of the moving portion based on the radial basis function (RBF); and

multiplying the color component ratio with an image to be compensated, and obtaining a compensation pixel value.

67. (New) The captured image data processing apparatus according to claim 63, wherein the data processing unit is characterized by:

performing the pixel value adjustment process based on the second image data acquired by way of an imaging process causing the first light source to emit light when a proportion of the

whole image of the moving portion detected by the motion detection unit is higher than a predetermined threshold value, and the pixel value adjustment data based on the second image data is set as final pixel value adjustment data.

68. (New) The captured image data processing apparatus according to claim 67, characterized in that the pixel value adjustment process based on the second image data performs either a white balance adjustment process according to the parameter set up based on the light component of the first light source, the white balance adjustment process according to the parameter set up based on ambient light component not including the first light source, or the white balance adjustment process according to the parameter set up based on an intermediate light component between the light component of the first light source and ambient light component not including the first light source.

69. (New) A captured image data processing method characterized by:

a step of acquiring first image data by way of an imaging process causing the first light source not to emit light;

a step of acquiring a second image data by way of an imaging process causing the first light source to emit light;

a step of subtracting, from a pixel value of each pixel which constitutes the second image data, a pixel value of a corresponding pixel of the first image data, and acquiring a difference image data corresponding to the image captured in an irradiation environment of only the first light source;

a difference image data pixel value adjustment processing step of performing a white balance adjustment process as the pixel value adjustment process with respect to the difference image data; and

a final pixel value adjustment image generation step of generating a final pixel value adjustment image by using the adjusted pixel value image data generated in the difference image data pixel value adjustment processing step.

70. (New) A captured image data processing method characterized by:

a step of acquiring a plurality of image data captured at mutually different times in a situation where light-emitting conditions of a first light source are the same;

a step of acquiring motion information based on comparison among the plurality of image data; and

a step of performing a process according to white balance set based on the motion information, with respect to either the plurality of image data, a portion thereof, all of them, or other image data.

71. (New) The captured image data processing method according to claim 70, characterized in that, in the step of performing the process according to the white balance set based on the motion information, the white balance is adjusted with respect to a portion corresponding to other image data captured either during a period when the plurality of image data is captured, or immediately before or immediately after the plurality of image data is captured,.

72. (New) The captured image data processing method according to claim 70, characterized in that, when it is determined that a motion is large based on the motion information, the white balance adjustment process is carried out based on either ambient light, flash light, or a virtual light source between ambient light and the flash light, in the step of performing the process according to the white balance set up based on the motion information.

73. (New) The captured image data processing method according to claim 70, characterized in that the step of performing the white balance treatment process set based on the motion

information further includes a step of adaptively switching the white balance adjustment processes for each portion of the image, instead of an uniform process for the entire image, and, based on the motion information, the image is interpolated from the image data of a still portion adjacent to a corresponding portion so as to obtain image data of the corresponding portion.

74. (New) A captured image data processing apparatus characterized by:

an imaging means for acquiring a plurality of image data by way of an imaging process causing a first light source not to emit light and an imaging process causing the first light source to emit light;

a memory for storing first image data acquired by way of the imaging process causing the first light source not to emit light and a second image data acquired by way of the imaging process causing the first light source to emit light; and

a data processing unit for performing a pixel value adjustment process based on the image data stored in the memory; wherein

the data processing unit includes:

a difference image data acquisition unit for subtracting, from a pixel value of each pixel which constitutes the second image data, a pixel value of a corresponding pixel of the first image data, so as to acquire a difference image data corresponding to the image captured in an irradiation environment of only the first light source;

a difference image data pixel value adjustment unit for performing a white balance adjustment process as a pixel value adjustment process with respect to the difference image data; and

a final pixel value adjustment unit for performing a final pixel value adjustment by using a image data of adjusted pixel values generated in the difference image data pixel value adjustment unit.

75. (New) A captured image data processing apparatus characterized by:

means for acquiring a plurality of image data captured at mutually different times in a situation where light-emitting and imaging conditions of a first light source are the same;

means for acquiring motion information based on a comparison between the plurality of image data; and

means for performing a process according to a white balance set based on the motion information, with respect to either the plurality of image data, a part thereof, all of them, or other image data.

76. (New) A computer-readable program for making a computer to execute steps of image data processing, the computer program characterized by:

a step of acquiring first image data by way of an imaging process causing a first light source not to emit light;

a step of acquiring a second image data by way of an imaging process causing the first light source to emit light;

a step of subtracting, from a pixel value of each pixel which constitutes the second image data, a pixel value of a corresponding pixel of the first image data, and acquire a difference image data corresponding to the image captured in an irradiation environment of only the first light source;

a difference image data pixel value adjustment processing step of performing a white balance adjustment process as a pixel value adjustment process with respect to the difference image data; and

a final pixel value adjustment image generation step of generating a final pixel value adjustment image by using the adjusted pixel value image data generated in the difference image data pixel value adjustment processing step.